

78C2246

FITCH, EVEN & TABIN

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FOUNDED IN 1859 AS  
GOODWIN, LARNED & GOODWIN

WILLIAM E. ANDERSON  
OF COUNSEL

**EFILED**

DOCKETED

CABLE ADDRESS "PATLAW"

TELEX 20-6566

NOV 8 1979

NOV 6 1979

CALIFORNIA OFFICE

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o'clock  
CLERK

JULIUS TABIN  
J. BRUCE McCUBBREY  
JOHN A. BUCHER  
DONALD L. BARTELS  
ADMITTED TO CALIFORNIA BAR

November 6, 1979

MORGAN L. FITCH, JR.  
FRANCIS A. EVEN  
JULIUS TABIN  
JOHN F. FLANNERY  
ROBERT K. SCHUMACHER  
ROBERT B. JONES  
DONALD L. WELSH  
JAMES J. SCHUMANN  
R. STEVEN PINKSTAFF  
J. BRUCE McCUBBREY  
JAMES J. HAMILL  
A. SIDNEY KATZ  
JAMES J. MYRICK  
ROGER D. GREER  
JOHN A. BUCHER \*  
RICHARD L. WOOD

PHILLIP H. WATT  
JEROLD B. SCHNAYER  
WAYNE E. NACKER  
ERIC C. COHEN  
DONALD L. BARTELS \*  
\* ADMITTED TO CALIFORNIA BAR ONLY

Honorable John F. Grady  
United States District Court  
Dirksen Building  
219 South Dearborn Street  
Chicago, Illinois 60604

Re: Bally Manufacturing Corporation  
vs. D. Gottlieb & Co., Williams  
Electronics, Inc. and Rockwell  
International Corporation  
Civil Action No. 78 C 2246  
Our File No. 37452

Dear Judge Grady:

This is plaintiff's reply to the letter of October 23, 1979, from defendant Rockwell's counsel in regard to its Motion to Dismiss and is also to bring certain facts to the Court's attention in opposition to the motion based on certain Rockwell documents only recently produced as a result of the Court's order of October 17, 1979 compelling discovery from Rockwell and on a recent deposition of a former Rockwell employee.

With respect to the letter of October 23, Rockwell's continuing characterization of its pinball controller device as being merely some "off the shelf hardware" is completely contrary to the evidence thus far developed in this case. For example, not only is the Rockwell pinball controller unique to pinball machines (as shown by the Footh deposition previously referred to in plaintiff's memorandum in opposition to the motion) but the controller made for Gottlieb pinball machines would be different than the controller made for some other pinball company, as shown by the deposition of Dale Folwell taken in California on October 30, 1979. Mr. Folwell was the engineering manager in charge of the Rockwell pinball control system project, but is now

Honorable John F. Grady

November 6, 1979  
Page 2

employed elsewhere. He testified (see copy of transcript attached.),

A: "We wouldn't sell the Gottlieb controller or the Williams controller to another customer. It was a proprietary product if the customer paid for the development.

Q: In both cases?

A: In any case when we'd develop a product for somebody, unless they'd let us sell it to somebody else and the customer was aware of it. We couldn't [sell] somebody else's product."

Moreover, the pinball control system sold by Rockwell to Gottlieb is not just a single device, but an entire electronic system including six printed circuit boards, each of which comprises numerous electronic components. These components include the A1752 and A1753 integrated circuit chips which are especially made for the Gottlieb pinball control system as noted in plaintiff's memorandum in opposition to Rockwell's motion.

Additionally, the attached documents\* which were just produced by Rockwell on October 28, 1979 clearly show that Rockwell was actively working with defendant Gottlieb after the patent in suit issued, i.e., June 6, 1978, through mid 1979, in furtherance of the manufacture of the infringing pinball machines. Rockwell's acts, such as continuing revisions to the circuits and general efforts in support of Gottlieb's manufacturing, as evidenced by these documents, constitute aiding and abetting of the infringement of the

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*R3668	R3604M	R3704M
R3748M	R3605	R3705
R3530M	R3711	R3701
R3740	R3712M	R3702
R3746M	R3713	R3699
R3747	R3714	R3700
R3606M	R3706	R3696
R3607	R3707	R3697M
R3744	R3708	R3698M
R3745	R3703	

Honorable John F. Grady

November 6, 1979  
Page 3

patent by Gottlieb and demonstrate a prima facie case of inducement and contributory infringement under the Patent Laws, 35 U.S.C. §271(b) and (c).

Respectfully submitted,

FITCH, EVEN & TABIN

By Donald L. Welsh /lam  
Donald L. Welsh  
Attorney for Plaintiff  
Bally Manufacturing  
Corporation

DLW:lam  
Enclosures

Of Counsel:

Glenn K. Seidenfeld, Jr., Esq. (w/encls.)

cc: John F. Lynch, Esq. (w/encls.)  
Melvin M. Goldenberg, Esq. (w/encls.)  
Gerson E. Meyers, Esq. (w/encls.)  
Charles S. Oslakovic, Esq. (w/encls.)

1 MR. WELSH: For pinball games. He said that the purpose  
2 of the contacts with Sega, Mattel, and Galaxie was to sell  
3 microprocessor systems or microprocessor chips for pinball  
4 games.

5 THE WITNESS: That's right.

6 Q BY MR. WELSH: So I asked, did you have any particu  
7 system in mind --

8 A Not at --

9 Q -- with respect to Sega?

10 A Not a complete system. In other words, we didn't  
11 have a standard part to sell them.

12 Q You didn't have a complete controller such as the  
13 Gottlieb controller?

14 A No. We wouldn't sell the Gottlieb controller or the  
15 Williams controller to another customer. It was a proprietary  
16 product if the customer paid for the development.

17 Q In both cases?

18 A In any case when we'd develop a product for somebody.  
19 unless they'd let us sell it to somebody else and the customer  
20 was aware of it. We couldn't somebody else's product.

21 Q Well, what parts of a system did you have in mind  
22 with respect to Sega?

23 A That's the basic microprocessor, which would be  
24 probably the PPS-4.

25 Q And you didn't have any design for pinball games  
26 beyond that in mind when you called on Sega?

27 A I don't believe so.

28 Q And how about Mattel?

A No. Just basically the application of those chips.

*Mattel*  
*file*

MEMO TO WAYNE NEYENS

Subject: Control Board Improvements

Date: June 7, 1978

The attached control board was built-up from Engineering lab parts to prove out the revised PWB. Actual component changes under study are flagged with the white bullseyes.

Items 1, 2, and 5:-

Amp Diplomate series low profile I.C. sockets which provide contact on two sides of mating pin instead of the present single side contact. The socket self aligns the mating pins for easy insertion and contacts are readily visible. I think this is a better socket.

Item 2

Amp dual in-line shunt which eliminates those soldering problems and shunts are visible for inspection.

Item 3

G. E. "Data Sentry" series Ni Cad battery which fits flat on board surface and can be wave soldered in place. This battery looks much better, etc.

Item 4

Soft Touch "Reset" switch should eliminate that breakage problem and board has no wiring on back side now.

*John Footh*

R 3668

# Internal Letter



# Rockwell International

Date: June 8, 1978

No. 78-760-GAV-089

TO: ~~Internal Address~~

- P. J. Lussier
- Autonetica
- Mexicali

FROM: ~~Internal Address~~

- F. L. Hooper
- Microelectronic Devices
- D/763 039 - 022-RD21
- .. 1831

Subject: Change Control Internal Letter

MODEL: Gottlieb Master Driver Module, P/N's PB00-D110-001 and PB00-D110-011

EFFECTIVITY: July, 1978

CHANGE: Incorporation of new artwork, P/N PB00-D123-001

## PARTS AFFECTED:

<u>Part No.</u>	<u>Name</u>	<u>Added</u>	<u>Deleted</u>	<u>Qty Changes -001 to -011</u>
PB00-D112-001	PWB		X	1
PB00-D123-001	PWB	X		1
721R01-052	Resistor		X	1
721R02-048	Resistor	X		1
742R01-001	Diode	X		7

Effectivity is scheduled for cum unit No. 33000. New material is scheduled to support unit No. 33001 in the month of July. However, complete all old configurations now in WIP. The quantity adjustment will be made on the end of the new PB00-D110-011 configuration.

## CHANGE POINT SUMMARY:

<u>Part No.</u>	<u>Qty Delv'd</u>	<u>M Date 241 WIP</u>	<u>June Sub Tot</u>	<u>July Qty Work Orders</u>	<u>July Cum Tot</u>
PB00-D110-001	<u>      </u>	7695	<u>      </u>	<u>      </u>	<u>      </u>
PB00-D110-011	Ø	Ø	Ø	<u>      </u>	<u>      </u>
Cum Totals	<u>      </u>	7695	<u>      </u>	<u>      </u>	<u>      </u>

*F. L. Hooper*

F. L. Hooper  
Production Control  
Subsystems Manufacturing

FLH:jh

See Distribution List

R3743M

# Internal Letter :

Date: August 15, 1978



# Rockwell International

No: .

TO: (Name, Organization, Internal Address)

F. W. Johnson  
D/316 022-420-100

FROM: (Name, Organization, Internal Address Phone)

E. H. Schaefer  
D/833 022-RC33  
252-3525

Subject: B-16 Directive Review for Gottlieb  
Follow-On Proposal

The following Engineering Commitment Review is submitted for the Gottlieb follow-on proposal in response to R&E Directive B-16.

Thirty six thousand sets of Gottlieb pinball printed circuit modules have been delivered through July 1978 at a rate of 5,000 sets per month. (A set consists of a control board, a master driver board, a four-digit display board, and four six-digit display boards.) Performance in the field has been excellent, with field problems representing less than [redacted] of the hardware delivered. Incoming inspection at Gottlieb has been steadily improving over the total period, with the display and driver boards running between one and three percent, and the major control board now under five percent.

A minimal number of producibility changes have been introduced for the follow-on deliveries in order to lower production costs. All such changes have been evaluated by MED Engineering, by MED Quality Assurance and by Gottlieb before incorporation. John Footh, the responsible design engineer since the beginning of the Gottlieb program, remains the full time responsible engineer through the follow-on program. Thus, the technical reliability and quality risk is considered to be a minimum.

In detail, the producibility changes consist of:

1. The elimination of three hand-wired components, which by board re-design have now been included in the total complement of parts being wave soldered.
2. Substitution of eight components, where superior or equal performance has been established through Engineering, QA and Gottlieb evaluations and where these eight components can be procured at lower costs.
3. Review of all components where substitutions could be made from other program usage where the combined procurement would result in lower costs. Five such parts are being used which, as stated, have been fully qualified on other programs.

In summary, since the proven configuration has been changed only in minor detail for manufacturing convenience, and because the responsible engineer remains in technical charge during the follow-on, therefore the continuing deliveries are expected to be successfully completed without significant technical problems.

*E. H. Schaefer*  
E. H. Schaefer  
Manager, Subsystems Development

cc: R. E. McHenry

R 3530M

# Internal Letter



# Rockwell International

Date: August 22, 1978

No: 78-766-TAG-135

TO: (Name, Organization, Internal Address)

- P. L. Nangreave
- Electronic Devices
- D/760 RD49

FROM: (Name, Organization, Internal Address, Phone)

- T. A. Geary
- Electronic Devices
- D/766 RC70
- 5666

Subject: Gottlieb Control Board  
Test Correlation

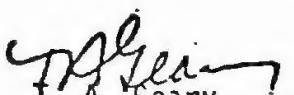
Analysis of a sample of 37 boards from the June deliveries has been performed by Engineering and leads to two areas where the EA03 Test is inadequately implemented. These are in the area of the GPKD Test (game display criver MOS) and the PGOL PROM interface (transistors referred to in the memo from L. Troxler to Dick Pinto).

The test adapter hardware provides for a more vigorous test of the GPKD interface but due to schedule priorities when the EA03/EA51 checkout was made, a rather simple test was implemented in software.

It is felt that additional program effort in this area can correct this problem.

The PGOL PROM interface was mechanized to allow two values of resistor (2.7K or 27K) at the outset of program and consequently the test was relaxed to allow this. Now that the system has been purged of the 27K version boards, a revised test method will be instituted to enhance the interface test.

Implementation of the above will require support from Engineering (Don Harmer) for programming and checkout. Don is scheduled to go to the East Coast for the month of September, so action must be taken immediately or a significant delay would be involved.

  
T. A. Geary

Test Equipment Engineering  
Device Subsystem Manufacturing

TAG:gsf

cc: W. Graham D/741 RC36  
J. Farmer D/761 RD47  
J. Footh D/833 RC33

R3740



Rockwell International

Internal Letter

Date: November 6, 1978

No: 78-760-GAV-173

TO: (Name, Organization, Internal Address)

- P. J. Lussier
- Autonetica
- Mexicali

Subject: Gottlieb Control Board Change

Engineering has identified the primary cause of the control board failure rate and is providing a fix. The failure rate of customer returns is [REDACTED]. In order to implement the change, the following plan should be followed:

1. The EA03 test adapter requires a minor modification and should be accomplished by Mexicali at the most convenient time.

Action: (a) Leon Goettinger to provide documentation to accomplish the modification by 11-8-78.

(b) Mexicali will accomplish modification.

(c) Leon Goettinger is to provide new test tape by 11-7-78.

2. The module change consists of replacing two existing resistors and deleting one resistor.

(a) It is not planned to change the module top assembly number unless Gottlieb requests same.

Action: John Footh by 11-13-78.

(b) Documentation will be provided by 11-15-78.

Action: John Footh.

(c) The change point is tentatively set at 11-20-78 and subs.

1. John Footh will identify resistor values by 11-6-78.

2. Purchasing will determine availability of resistors.

3. The new tape will be implemented on 11-20-78.

R37467

P. J. Lussier  
November 6, 1978  
Page 2

I.L. No. 78-760-GAV-173

- (d) Starting 11-20-78, all customer returns will be reworked and tested with the new tape.
- (e) Rework all assemblies not wave soldered. After wave solder, rework functional test failures only.

*F. L. Hooper*

F. L. Hooper  
Production Control  
Subsystems Manufacturing

FLH:jh

cc: W. R. Cuilty  
J. D. Farmer  
J. W. Footh ✓  
T. A. Geary  
L. S. Goettinger  
W. J. Graham  
P. L. Nangreave  
L. T. Troxler  
G. A. Van Bebber  
R. R. Wall *RRW!*

R 3747

Internal Letter

Rockwell International

November 14, 1978

TO E. H. Schaefer  
D/833, RC33

FROM R. T. Gaughen  
D/751, RC47

Phone 2322

Meeting on Possible Cost Savings Resulting  
from Replacing Radial Leaded Hand Inserted  
Capacitors with Axial Leaded (Tape and Reel)  
Capacitors

Ref.: Rockwell PIC Spec 404R14-034

Place: Building 222, 2nd Floor, Conference Room M100

Date: November 15, 1978; 10:00 A.M.

#### I. INFORMATION

In the interest of cost reductions due to possible (1) improved design layouts, (2) improved manufacturing techniques (hand inserted vs. automatic insertion) and (3) reduced procurement costs, a meeting is being called for the purpose of informing responsible engineers, manufacturing engineers, Quality Control and other interested personnel in the possible use of axial lead capacitors in lieu of radial leaded capacitors.

R36068A

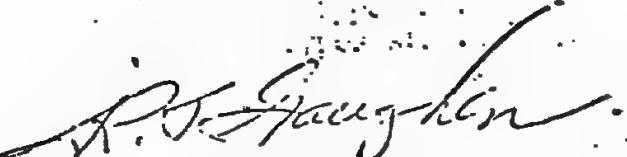
E. H. Schaefer  
November 14, 1978  
Page 2

III. REQUESTED ATTENDEES, ROCKWELL

W. Brennan ✓  
T. Delcourt  
D. Dorsch  
J. Footh  
D. Harenberg  
R. Hodson  
H. Maxwell  
D. Twu  
R. Wall  
E. White  
L. White

IV. REQUESTED ATTENDEES, VARADYNE

Rajan Bhattacharyya  
Wayne Devine  
John M. Shepard

  
R. T. Gaughen  
Senior Buyer  
Purchasing

RTG/pmc

R 3607

*Letter*



Rockwell International

Date: November 15, 1978

No: 78-833-080-JWF-099

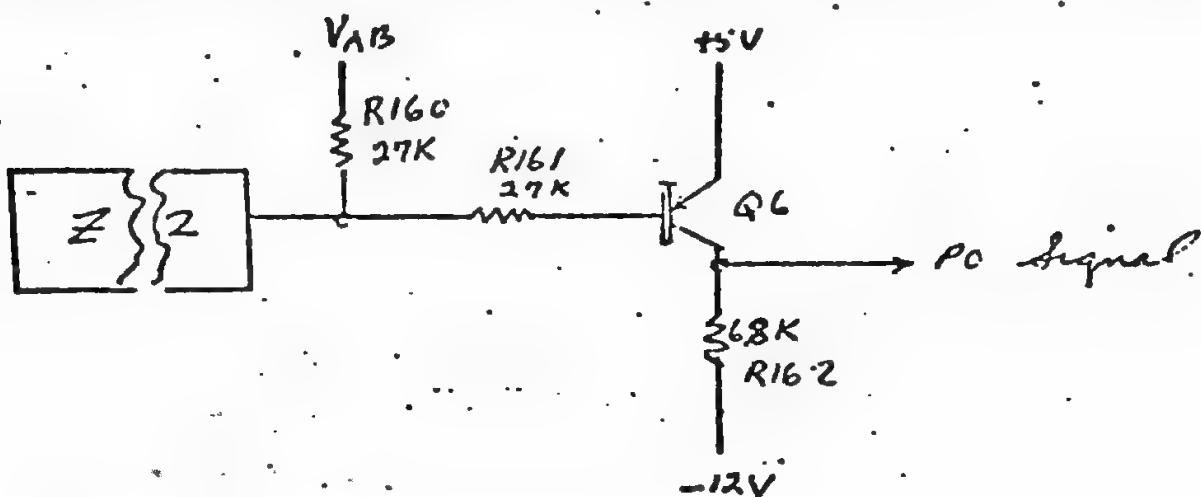
TO: (Name, Organization, Internet Address)  
Those Listed

FROM: (Name, Organization, Internet Address, Phone)

J. W. Footh  
D/833-080 022-RC33  
3577

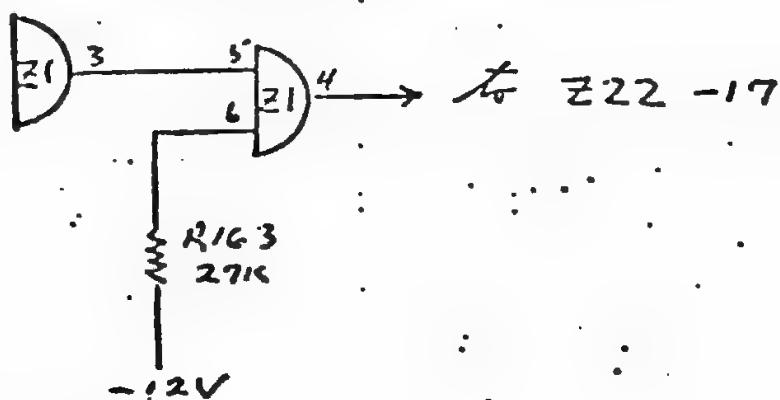
Subject: Modifications to Control Board,  
Part No. PB00-D100-31

During my recent visit to Gottlieb, I discussed some changes to the present control board configuration, and the customer has agreed with our recommendations as follows:



1. Delete R160 (27K) resistor from assembly.
2. Revise R161 resistor value from 27 K $\Omega$  to 43K $\Omega$ .
3. Revise R162 resistor value from 6.8K $\Omega$  to 2K $\Omega$ .

In addition to the above changes, the customer has requested that R163 be changed from 27K $\Omega$  to 6.8K $\Omega$ . This new resistor value seems to eliminate bookkeeping problems on some field returns.



I have agreed to this change.

R 3744

Those Listed  
November 15, 1978  
Modifications to Control Board,  
Part No. PB00-D100-31

Page 2

To recap: Delete one resistor and revise three resistor values. The assembly part number and dash number to stay the same. Effectivity to be approximately 11-30-78 for new boards and all field returns to be modified before returning to customer.

The customer to modify on individual basis as required by field failure symptom.

J. W. Footh

J. W. Footh  
Subsystems Engineering

Distribution:

T. D. DelCourt	833	RC33
T. A. Geary	766	RC70
W. J. Graham	741	RC28
A. C. Lamkins	751	RC47
R. W. Maney	763	RD21
E. H. Schaefer	833	RC33
G. A. Van Bebber	760	RD21
R. R. Wall	760	RD49

R 3745

Internal Letter



Rockwell International

Date November 21, 1978

No.

TO: R. R. Hodson  
D/833-051 022-RC33

FROM: E. H. Schaefer  
D/833 022-RC33

3525

Subject: Axial Lead Capacitors

Purchasing has found an axial lead capacitor which may be a very attractive substitute for the Blue Max radial lead. The advantages are the lower cost for the capacitor itself plus the big advantage of being automatically insertable.

Bill Cuilty is expediting sample parts from three sources so that qualification tests can be carried out by Quality Assurance, and he is also attempting to help QA with outside testing sources so that the qualification can be expedited.

I would like you and David Twu to take the lead in getting a new specification into the system with multiple qualified sources so that these parts can be used in future designs. This also involves your working with Manufacturing Engineering to establish the standard lead bend configuration. Assuming that qualification is successful, I would then like you to issue the necessary application notes and state clearly that this axial capacitor is the preferred part (in the values for which it is obtainable) in all future designs and that the corresponding values of the Blue Max type are to be phased out. This finalization effort is important because of the advantages, but it also must be done prudently because we want to be sure that we have a good part before committing to it.

The above is on standard parts for all future designs. Bob Mosier will have to decide whether he also can use this part in Telecom designs, and by copy of this IL I am indicating our plans and asking that he give it consideration.

Gottlieb is a special consideration because the Gottlieb system uses about 60% of the Blue Max capacitors so that the savings can be considerable if we can work it out. However, we want to be very careful with Gottlieb because of our high running rate and because of the sensitivity of this particular customer to changes.

1. The proposed tight bend to fit the .25" hole space is completely unacceptable, because of the reliability risk of incipient cracks in the glass seal. Long years of experience have taught us that the leads need to come out straight for a reasonable distance and then be bent down, rather than being sharply bent down at the seal. The only long shot basis on which such a bend might be acceptable is if all the potential suppliers of the axial lead capacitor would certify that the bend method would not

R 3604M

R. R. Hodson  
November 21, 1978  
Axial Lead Capacitors  
Page 2.

1. be deleterious to their capacitors' performance over a long period of time. With such certification letters in hand, which I doubt they would write, we might consider it further, but otherwise, not.
2. So one option for using them in Gottlieb with the present hole space would be for Manufacturing Engineering to come up with some acceptable bending method whereby the leads come out straight and then tuck back in for the .25" hole space. To be acceptable, such a compound bend would have to result in the capacitors ending up very close to the board, parallel to the board, neat in appearance, and not cocked in all directions as the Blue Max parts are wont to do. Clearly this is a difficult assignment, but nothing less will be acceptable to Engineering, nor to Gottlieb.
3. An alternate option would be to set a change point and make a new layout of the Gottlieb boards. Such a change point would have to be far enough in the future to enable us to phase in new boards. In order to consider this option, I would like you to make an estimate of the engineering time involved in such a re-layout and also estimate when your workload might allow such effort to take place. Bill Cuilty can estimate the cost of new board tooling and the necessary time for new board procurement. With these pieces of information we could consider whether this is a cost effective option and when it might be practical to set the change point.
4. If we can't find a practical way to make the changeover in the present design, we certainly must find a way to start with the No. 1 production part of the second design. This, too, will require some planning, because the prototypes are already being laid out, using the Blue Max parts.

After you have had a chance to work this problem for a while, perhaps you should call a meeting of those on the distribution list of this IL to finalize our plans.

*E. H. Schaefer*

E. H. Schaefer  
Manager  
Subsystems Engineering

Distribution: W. R. Cuilty  
J. D. Farner  
J. W. Footh  
R. K. Mosier  
L. T. Troxler  
Designs.

R 3605

~~Customer Letter~~

Date: January 29, 1979



Rockwell International

No: SQA-79-741-14

TO: (Name, Organization, Internal Address)  
• R. Wall  
• D/760, 022-RD49

FROM: (Name, Organization, Internal Address, Phone)  
• W. J. Graham  
• D/741, 022-RC28  
• 4142

Subject: Five Driver Boards with R3 Stamped on Them  
Returned from Gottlieb

Ref.: Customer Correspondence, Wayne Neyens to Ray Wall,  
dated December 11, 1978

The subject driver boards were tested here in Anaheim and found to be defective as follows:

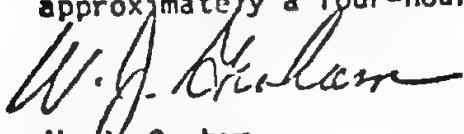
<u>Board Serial No.</u>	<u>Reason for Failure</u>
018101	Printed circuit board short between Z7 and Z8.
116493	
103133	
X0001 (assigned S/N)	Open circuit J1-22 to C10 caused by printed circuit board open trace. Jumper was added - however, incorrectly.
116691	Q18 has internal short.

The boards were sent to Mexicali to check compatibility of test results. The boards all passed with the exception of one (S/N 116691).

A meeting was held with the test equipment engineer, R. Brunskill, to determine how these boards could pass the tester. An examination of the tester circuitry revealed a fallacy in the use of the strobe signals used to latch and compare data.

In order to detect shorts between latches, such as occurred on these driver boards, separate strobe signals must be provided for the tester and the unit under test.

Redesign has been completed with documentation under way. Rework of the tester will require addition of components and rewiring. How this is to be accomplished must be worked by test equipment engineering and manufacturing. It will require approximately a four-hour effort.

  
W. J. Graham

Subsystems  
Quality Assurance

R 3711



Date: • February 9, 1979  
TO: *(Name, Organization, Internal Address)*  
• Those Listed  
•  
•  
Subject: • Gottlieb Program

No: • TSP-GMG-79-02

FROM: *(Name, Organization, Internal Address, Phone)*

• G. M. Gross  
• D/821, 022-RC28  
• 5750

• #1 *Euroje Nige*

#2 *EA03! Game*

Those listed are requested to attend a Gottlieb Program Review meeting on Tuesday, February 13, 1979 in Conference Room MA3, Bldg. 221, at 9:00 A.M.

*10:30*

The purpose of the meeting is to status existing actions, review areas of concern based on my review in Mexicali and assign actions accordingly. The following areas will be discussed. Please be prepared to present current status and your commitments for completion.

## I. ENGINEERING AND TEST EQUIPMENT

Responsible: J. Footh & T. Geary

- { 1) P/N 482R30-001: Why are Fairchild parts acceptable and Solid State Scientific unacceptable? Is the problem due to specification, circuit design and/or test?
- 2) EA03 Test Correlation with Game: The current reject rate  at Gottlieb incoming and in-house test data  indicate we still do not have an acceptable EA03 test. What is the plan and schedule to resolve this lack of correlation?
- 3) EA52 Test Correlation with Game: Correlation is unacceptable. Boards with shorts will pass the EA52 but fail in the game. What is the plan and schedule to resolve this?
- 4) EA53 Display Tester: Display boards with shorts will pass the tester but fail the game. The test problem may also be inadequate to check enough segments. What is the plan and schedule to resolve this?
- 5) Mexicali feels the EA51-M8000 troubleshooting manual is not sufficient to support the program efficiently. They recommend a training class be provided for the technicians. Please be prepared to comment objectively on the best way to improve Mexicali in fault isolation and diagnostics for repairing control boards.

R 37124

- 6) Mexicali needs 2nd test adapter for EA03. This adapter is currently in Anaheim. When can it be returned?

## I. MANUFACTURING/PRODUCTION ENGINEERING

Responsible: R. Wall

- 1) P/N 441R11-002: We are currently hand installing this diode, CR38, instead of automatically inserting. The reason given by Mexicali was that it is being brought in bulk instead of tape rolls. Please provide schedule for converting to automatic insertion.
- 2) Faultfinder Yield: The current yield tracking, to the best of my knowledge, is only representative of Functional Test. Faultfinder yield should be tracked and published separately.
- 3) Four- & Six-Digit Display Packaging: The carton preparation time is excessive. Current design and methods need to be revised to reduce overall costs. Provide schedule for evaluating and recommending cost reduction.
- 4) MTR 087: This MTR evaluates using axial-leaded capacitors in place of radial-leaded capacitors. Provide schedule dates for completion of evaluation units, Engineering/Q.A. approval, customer approval and planned effectivity for changeover.
- 5) Game Simulators: A Gottlieb game simulator bench tester was provided to Newport Beach for MOS Product Assurance testing. A second unit was ordered but not received for Q.A. Anaheim. This bench tester is required in Mexicali to support customer returns and allow sampling of new production units. Provide date when this unit will be delivered to Mexicali, and obtain cost and lead time for a third unit.
- 6) Six-Digit Display: Effectivity point for configuration change for eliminating resistor/capacitor lap soldering must be established and notification given to Gottlieb.

## III. QUALITY

Responsible: W. Graham

- 1) Mexicali feels that feedback on problems leaves something to be desired.  
e.g.,
  - o Component failure analysis results/reports.

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1) Continued:

- Disposition of customer returns sent to Anaheim.
- Displays sent to Anaheim for acceptance criteria.

2) Acceptance criteria on displays still in question.

3) Customer Return Procedure not updated to current requirements  
(reference I.L. from Valdez).

Please provide inputs on any other current actions or problems that need to be addressed.

*J.W. Neois*

G. M. Gross  
Program Manager  
Telecom/Subsystems Products

GHG:eh

cc: Attendees:

J. W. Footh  
R. R. Wall  
T. Geary  
R. Mayorga  
W. J. Graham

Info. Only

R. C. Pinto  
R. Tirado  
J. Valdez  
E. Nunez  
G. Van Bebber  
J. D. Farner  
L. T. Troxler  
E. H. Schaefer

R 3714

**Internal Letter****Rockwell International****Date:** • February 14, 1979**No:** TSP-GMG-79-05**TO:** (Name, Organization, Internal Address)**FROM:** (Name, Organization, Internal Address, Phone)

• Those Listed

• G. M. Gross  
• D/821-022-RG28  
• 5750

•

•

•

**Subject:** • Gottlieb Program Action Items

A program review meeting was held 2/13/79. The below listed actions summarize the results of the meeting.

**Action****Responsible****Due Comple**

- 2-14-79 OK 1. Resolve circuit compatibility for P/N 482R30-001: Determine if circuit is marginal or component spec should be more specific and revise accordingly. EA03 time for evaluation is scheduled for 2/14/79. J. Footh 2/16/79
2. Resolve EA03 test correlation with game:  
1) QA to provide engineering with data showing percentage of escape rate and breakdown of failure modes. Test program revision letter to be verified for compatibility between Mexicali and Anaheim then all samples to be retested on EA03 and game.  
2) Eng to review data and make changes to EA03 as required.  
3) QA to establish test tape control system in Mexicali. 1) W. Graham 3/2/79  
2) T. Geary 3/16/79  
3) L. Troxler 3/2/79  
J. Valdez
- 2-14-79 OK 3. Resolve EA52 test correlation with game: Tester sent to Anaheim for modification 2/12/79. T.E. Eng to complete two days after receipt. T. Geary 2/16/79  
J. Starnes
4. EA53 test escapes: 1) Need samples of display boards that pass tester but fail game. Also need percentage of escapes.  
2) QA to add additional segment test to outgoing sample plan. 1) E. Nunez 2/23/79  
2) L. Troxler 2/23/79  
J. Valdez

R 3700

*those Listed*  
February 14, 1979  
Page 2

TSP-GMG-79-05

<u>Action</u>	<u>Responsible</u>	<u>Due Complete</u>
5. Need for additional technical training: Mexicali and Test Equipment Engineering to negotiate plan.	E. Nunez T. Geary	TBD
6. Evaluate need for 2nd EA03 test adapter in Mexicali. Adapter currently needed and used in Anaheim by Eng & QA.	R. Mayorga	2/23/79
7. 1) Evaluate high failure rate of G.E. batteries and implement corrective action. 2) Implement battery test as part of QA outgoing sample.	1) J. Footh 2) W. Graham	2/23/79 2/23/79
8. Excessive lead length protruding through boards causes unnecessary board failures. QA to increase inspection efforts to assure manufacturing is staying within .100" maximum stick through.	J. Valdez	Immediately
9. Evaluate high failure rate of low voltage CPU test. Determine if MOS, T.E., specification or board contamination is problem and implement corrective action.	L. Goettinger	3/2/79
10. Determine potential cost savings if new sealed digi-switch is utilized and socket eliminated.	R. Mayorga	2/23/79
11. Silicon General 6118 Drivers have failed qualification twice. Engineering to review data and determine if additional qualification attempts are warranted.	J. Footh	2/23/79
12. Review design of power on reset circuit to determine if adequate margin exists.	J. Footh	3/2/79
13. Provide date when CR38 Diode, P/N 441R11-002, will be available in tape reels for automatic insertion.	R. Wall	2/16/79

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Those Listed  
February 14, 1979  
Page 3

TSP-GMG-79-05

Action	Responsible	Due Complete
14. Report fault finder yields as well as functional test yields.	E. Nunez	2/23/79
15. Recommend cost reduction for packaging four and six digit displays.	R. Mayorga	3/2/79
16. Determine lead time for procuring axial leaded capacitors to replace radial leaded capacitors. Need to predict anticipated effectivity point.	R. Wall	2/23/79
17. Obtain game simulator from System Kontakt and provide date one will be shipped to Mexicali.	R. Wall	2/23/79
18. Obtain effectivity point for configuration change for eliminating resistor/capacitor lap soldering.	R. Wall	2/23/79
19. Update customer returns procedure.	W. Graham	3/2/79
20. Provide regulator for house vacuum in Mexicali.	A. Lora	3/2/79

The next review meeting will be held in MA3 on 2/26/79 at 9:00 a.m.

*G. M. Gross*

G. M. Gross  
Program Manager  
Telecom/Subsystems Products

Info Only:

R. Tirado  
G. Van Bebber  
J. Farner  
E. Schaefer  
J. Hosoda

Action Assignees:

J. Foothx  
R. Wall  
T. Geary  
L. Goettinger  
R. Mayorga  
W. Graham  
L. Troxler  
J. Valdez  
E. Nunez  
A. Lora  
J. Starnes

R3708



Rockwell International

Date: February 27, 1979

No.: TSP-GMG-79-06

TO: (Name, Organization, Internal Address)

FROM: (Name, Organization, Internal Address, Phone)

- Those Listed
- \_\_\_\_\_

- G. M. Gross
- D/821, 022-RC28
- \_\_\_\_\_
- 5750

Subject: Gottlieb Program Action Items

A program review meeting was held 2/26/79. Those in attendance were:

G. Gross

J. Footh

L. Troxler

W. Graham

R. Wall

F. Hooper

T. Geary

The following action items remain open:

Action	Responsible	Due Complete
1. Resolve three major failure modes experienced at Gottlieb <ul style="list-style-type: none"><li>1. Segments</li><li>2. Power On</li><li>3. Bookkeeping</li></ul> Circuit compatibility fix for P/N 482R30-001 is to be resolved as part of above fixes when determined.	J. Footh	3-16-79
2. Resolve EA03 test correlation with game. <ul style="list-style-type: none"><li>A) QA to provide Engineering with data showing percentage of escape rate and breakdown of failure modes.</li><li>B) Engineering to review data and make changes as required.</li><li>C) QA to verify tape control system in Mexicali.</li></ul>	A) W. Graham B) T. Geary C) L. Troxler	3-02-79 3-16-79 3-02-79
3. Resolve EA53 four- & six-digit test escapes. <ul style="list-style-type: none"><li>A) Engineering/QA to determine why the high return rates on displays and implement corrective action to achieve &lt;1% return rate.</li></ul>	A) J. Footh W. Graham	3-08-79

R 3703

*Those Listed  
February 27, 1979  
Page 2*

TSP-GMG-79-06

<u>Action</u>	<u>Responsible</u>	<u>Due Complete</u>
4. Evaluate high failure rate of low voltage CPU test and implement corrective action.	L. Goettinger	3-02-79
5. Report faultfinder yields as well as functional test yields in a timely fashion, i.e., bi-weekly.	E. Nunez	2-23-79 (past due)
6. Recommend cost reduction for packaging four-and six-digit displays.	R. Mayorga	3-02-79
7. QA to implement procedural coverage for utilization of game simulator in Mexicali.	W. Graham	3-16-79
8. Update customer returns procedure.	W. Graham	3-02-79

NEW ACTIONS:

3. Provide CRD & Packing List to Financial for all customer returns.
4. Issue MTR with detailed schedule for evaluating the following proposed changes:
- A) Axial Leaded Capacitors
  - B) Clip for Displays
  - C) Sealed Digi Switches
  - D) Redesigned MOS -
- A1752 EF  
A1753 EE
- L. Troxler                            3-02-79
- A) W. Graham                         Complete
- B) R. Mayorga                        3-02-79
- C) W. Graham                        3-02-79
- D) G. Gross                         3-02-79

R3704M

Those Listed  
February 27, 1979  
Page 3

TSP-GMG-79-06

The next review meeting will be held in MA3, Bldg. 221, on 3-12-79  
at 9:00 a.m.

*G.M. Gross*

G. M. Gross  
Program Manager  
Telecom/Subsystems Products

GMG:eh

Info. Only:

R. Tirado  
J. Valdez  
G. Van Bebber  
J. Farner  
E. Schaefer  
J. Hosoda

Action Assignees:

J. Footh  
R. Wall  
T. Geary  
L. Goettinger  
R. Mayorga  
W. Graham  
L. Troxler  
E. Nunez  
S. Jensen

R3705

**Internal Letter****Rockwell International**

Date: . February 28, 1979

No: . TSP-GMG-79-08

TO: (Name, Organization, Internal Address)  
Those ListedFROM: (Name, Organization, Internal Address, Phone)  
G. M. Gross  
D/821, 022-RC28  
5750

Subject: GOTTLIEB FOUR-DIGIT DISPLAYS

Ref.: IL 79-833-080-JWF-017, "Evaluation of Twenty-Two  
4-Digit Boards from Mexicali," dated 2/29/79,  
from J. Footh to Those Listed

A meeting was held 2/27/79 to discuss the referenced letter and initiate appropriate corrective actions. The below listed were in attendance:

G. Gross	R. Mayorga
J. Footh	L. Troxler
R. Wall	J. Hosoda

The conclusions reached in the meeting generated the following action items:

Action:	Responsible	Due Complete
1. Determine if rejected Futuba displays can be returned if the lead length has been reduced from <u>lead trimming</u> operation.	C. Lamkins	3-02-79
2. Revise drawings/MOI's as required to specify new maximum lead protrusion of display.	J. Footh R. Mayorga	3-09-79
3. Modify tooling to prevent excessive lead protrusion based on new requirement to be established by Item 2.	E. Williams	3-23-79
4. Revise drawings/MOI's to eliminate 2 resistors previously required for Sprague drivers and to replace hand-inserted jumpers with machine-inserted jumpers.	J. Footh R. Mayorga	3-09-79

R 3701

TSP-GMG-79-08  
Those Listed  
February 28, 1979

Page 2

<u>Action</u>	<u>Responsible</u>	<u>Due Complete</u>
5. Modify EA53 display tester and software to test for all segments and prevent shorts from passing the test.	T. Geary	3-15-79
6. Revise QA documentation to require outgoing sample plan and customer returns to be tested for all segments and digits.	L. Troxler	3-15-79
7. Redesign PWB to eliminate unnecessary pads and open spacing to make more producible. Schedule Milclad material change, display clip and producibility improvements to coincide and present samples to Gottlieb for block change point approval.	J. Footh G. Gross	TBD

*G.M. Gross*

G. M. Gross  
Program Manager  
Telecom/Subsystems Products

GMG:eh

<u>Info. Only</u>	<u>Action Assignees</u>
R. C. Pinto	C. Lamkins
P. L. Mangreave	J. Footh
R. Tirado	R. Mayorga
J. Valdez	E. Williams
E. Schaefer	T. Geary
E. Nunez	L. T. Troxler
J. D. Farmer	
R. R. Wall	
J. Hosoda	
F. Hooper	

R 3702

~~Memorandum~~ Letter



Rockwell International

*[Signature]*

Date: March 13, 1979

No. TSP-GMG-79-11

TO: (Name, Organization, Internal Address)  
Those Listed

FROM: (Name, Organization, Internal Address, Phone)

- G. M. Gross
- D/821, 022-RC28
- 5750

Subject: Gottlieb Program Action Items

A program review meeting was held 3/12/79. Those in attendance were:

G. Gross	L. Troxler
J. Footh	R. Mayorga
R. Wall	T. Delcourt

The following actions remain open:

Action	Responsible	Due
1. Resolve three major failure modes experienced at Gottlieb.	J. Footh	3-30-79
A. Segments		
B. Power On		
C. Bookkeeping		
The first two problems appear to be correctable by deleting resistor R156. An MTR is being prepared by R. Mayorga for Mexicali to delete R156 on 50 each (100 total) known defective boards for CPU low-voltage failures and power on failures.		
2. Resolve EA53 four- and six-digit test escapes. This action has been partially completed by the modified program implemented ~3-05-79. Some additional escapes are still possible, and Test Equipment Engineering is to evaluate need for additional modifications.	T. Geary	3-30-79
*3. Report faultfinder yields as well as functional test yields in a timely manner.	E. Nunez	2-23-79 (past due)

March 13, 1979  
Page 2

Action	Responsible	Due
4. Recommend cost reduction for packaging four- and six-digit displays. A sample four-digit box was presented which allows for 20 displays/box and eliminates most of the preparation labor.	R. Mayorga	3-30-79
New actions are:		
A. Provide sample boxes to Q.A. for evaluation testing .	R. Mayorga	3-26-79
Four Digit      3-12-79		
Six Digit      3-26-79		
B. Perform post office, vibration & drop tests and report results.	W. Graham	3-28-79
Four Digit      3-14-79		
Six Digit      3-28-79		
C. Calculate estimated net cost savings per system.	R. Mayorga	3-23-79
5. Q.A. to implement procedural coverage for utilization of game simulator in Mexicali. Unit has been received by Q.A. and is in process of check out.	W. Graham	3-16-79
*6. Update customer returns procedure.	W. Graham	3-02-79 (past due)
7. Track MTR's and assure completion as scheduled.	R. Wall	
A. Axial leaded capacitors.	MTR #	Due Comp.
B. Clip for displays	087	Comp.
C. Sealed digi switches	092	4-05-79
D. Re-designed MOS	091	3-15-79
	093	4-13-79
*8. Revise drawings/MOI's as required to specify new maximum lead protrusion for Futaba displays.	J. Footh R. Mayorga	3-09-79 (past due)

R 3700

1979  
Date  
No.  
Those Listed  
Information, Internal Address

TSP-GMG-79-16

No.

FROM: (Name, Organization, Internal Address, Phone)

G. M. Gross  
D/821, 022-RC28  
5750

Subject: Gottlieb Program Action Items

A program review meeting was held May 7, 1979. Those in attendance were:

G. M. Gross	F. Hooper
J. W. Footh	R. Mayorga
R. R. Wall	J. Hosoda
W. J. Graham	G. Van Bebber

The following actions remain open:

<u>Action</u>	<u>Responsible</u>	<u>Due</u>
1. Resolve incompatibility between Gottlieb and Mexicali control board tests. Ref. MTR 086.	W. Graham J. Footh	5-21-79
2. Complete evaluation of glass/ceramic axial leaded capacitors on control and driver boards. Submit results and samples to Gottlieb for approval. Ref. MTR 087	W. Graham J. Footh G. Gross	5-28-79
3. Complete evaluation of A1752 EF and A1753 EE devices and submit results and samples to Gottlieb for approval. Ref. MTR 093.	W. Graham J. Footh G. Gross	5-28-79
4. Initiate MTR to evaluate display dips and order production tooling.	W. Graham J. Footh R. Wall	5-18-79
5. Initiate MTR to evaluate Sealed Digi switches and submit samples to Gottlieb for approval.	W. Graham J. Footh	5-28-79
6. (E.) Initiate MTR to evaluate new 4 digit PCB design.	J. Footh	5-11-79
7. Initiate MTR to evaluate new display packaging materials.	R. Mayorga	5-11-79

COMPLETED  
5-7-79

R 3696

Those Listed  
May 8, 1979  
Page 2

	<u>Action</u>	<u>Responsible</u>	<u>Due</u>
8.	Initiate MTR to evaluate new display PCB materials.	W. Graham J. Footh	5-11-79
9.	Review and revise accordingly display board drawings for realistic display alignment and tape criteria.	J. Footh	5-18-79
10.	Schedule FAI on new display tooling and wave soldering method.	W. Graham	TBD
11.	Standardize PCB board designs to include areas for Q.A. labels and customer returns information. Modify drawings accordingly.	L. Troxler R. Hodson	5-18-79

R 3097M

Those Listed  
May 8, 1979  
Page 3

<u>Action</u>	<u>Responsible</u>	<u>Due</u>
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*G. M. Gross*

G. M. Gross  
Program Manager  
Telecom/Subsystems Products

Enc.

cc:      Action Assignees:

- W. Graham
- J. Footh
- R. Wall
- R. Mayorga
- L. Troxler
- R. Hodson
- J. Hosoda
- S. Jensen
- G. Van Bebber

Info. Only:

- J. Farmer
- F. Hooper
- E. Schaefer

R3098M